# RECORDING MEDIA HAVING PROTECTIVE OVERCOATS OF HIGHLY TETRAHEDRAL AMORPHOUS CARBON AND METHODS FOR THEIR PRODUCTION


## ABSTRACT OF THE DISCLOSURE

The invention provides systems and methods for the deposition of an improved diamond-like carbon material, particularly for the production of magnetic recording media. The diamond-like carbon material of the present invention is highly tetrahedral, that is, it features a large number of the $sp^3$ carbon-carbon bonds which are found within a diamond crystal lattice. The material is also amorphous, providing a combination of short-range order with long-range disorder, and can be deposited as films which are ultrasmooth and continuous at thicknesses substantially lower than known amorphous carbon coating materials. The carbon protective coatings of the present invention will often be hydrogenated. In a preferred method for depositing of these materials, capacitive coupling forms a highly uniform, selectively energized stream of ions from a dense, inductively ionized plasma. Such inductive ionization is enhanced by a relatively slow moving (or "quasi-static") magnetic field, which promotes resonant ionization and ion beam homogenization.